

REMARKS

Claims 1-8 in the application have been cancelled. Applicant appreciates the Examiner's patience.

New claims 9-20 have been added.

Ayub, U.S. Patent No. 4,805,694 (hereinafter referred to as ("Ayub")) shows turnaround chambers (such as 68). The fluid, which is liquid and gas, enters the subchamber 68a through tube bundle 90, passes through the gap 82 and enters the subchamber 68b, before exiting into tube bundle 92. The cross-sectional area of the gap 82 is substantially equal to the cross-sectional area of the ingressing tube bundle 90.

However, the cross-sectional areas of the subchambers 68a and 68b are not in conformance with the gap 82 for the ingressing tube bundle 90. This is because the height of the subchambers (for example, the distance between plates 78 and 66 for subchamber 68b) is determined partially by the number of tubes in the respective tube bundle 92 that communicates with that subchamber. Thus, the fluid exits the tube bundle 90 and enters the subchamber 68a, which is shown enlarged relative to the gap 82. The fluid experiences a pressure drop in the subchamber 68a and then a pressure increase in the gap 82. The fluid experiences another pressure drop in subchamber 68b. These pressure drops can lead to flashing, an undesirable phenomenon that reduces the efficiency of the heat exchanger.

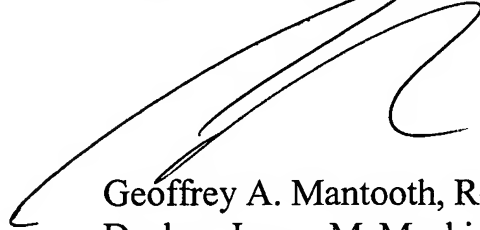
Applicant's invention forms a chamber or subchamber with a wall spaced from the tube sheet. The chamber is a turnaround and effectively forms a gap between the wall and the tube sheet for fluid to pass through. The cross-sectional area of the subchamber is determined by the distance of the wall from the tube sheet (as the width of the wall, shown in Fig. 2 as the dimension from left to right, is fixed). Because the gap is incorporated into the subchamber, the pressure of the fluid flowing through the subchamber can be controlled. The fluid is not subjected to pressure drops with Applicant's invention. Contrast this with Ayub, where the gap is in series with two chambers and the fluid pressure cannot be controlled.

Claim 9 provides that the second fluid inlet communicates with a chamber, which chamber has a cross-sectional area that is substantially equal to the cross-sectional area of the tubes egressing from the chamber. Thus, the flashing phenomenon does not occur in this initial chamber that is adjacent to the tube inlet. Ayub shows a chamber 60 that is adjacent to the tube inlet 44. However, there is no teaching of sizing this chamber to reduce pressure drops.

In view of the foregoing, it is respectfully submitted that all of the claims in the application are allowable, and such allowance is respectfully requested.

Enclosed is a check in the amount of \$129.00 for the new claims. If any additional fees are required, please charge our deposit account number 23-2770.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Geoffrey A. Mantooth', written over a horizontal line.

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